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Using Surveys as Input to Comprehensive Watershed Management: A Case Study From Minnesota

Tim Kelly and Ron Sushak

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Comprehensive watershed management, a new type of resource management now being implemented in southeastern Minnesota, recognizes that the watershed community and land managers can make choices that will result in a healthy watershed now and in the future. To succeed, such management needs four components: citizen participation, a comprehensive perspective, a long-term view, and partnership. In the following case study, we focus on citizen participation and on the use of surveys to achieve it.

The Minnesota Department of Natural Resources (DNR) is currently engaged in an outreach program to local units of government in a six-county area that covers half of the southeastern region (bluffland counties in figure 1). In addition, the DNR and several individuals and organizations have formed the Wells Creek Watershed Partnership (WCWP)[1], one of a handful of attempts to implement comprehensive watershed management in Minnesota. To make these outreach efforts more effective, the DNR and the USDA Forest Service designed a public opinion survey that gathered information from regional residents.

Comprehensive watershed management, as well as the other outreach efforts, needs the support of the people it affects. One way to gather that support is to directly involve people in the management planning process. But not many people can be expected to have the time or high level of motivation needed for direct participation. Nor can a management process be expected to accommodate large numbers of direct participants.

As an alternative to direct participation, the survey is an effective technique to assess the concerns of an affected population. But surveys can address only a limited range of topics to only a limited depth. All surveys, including the one here, need to work within these limitations.

The topics we selected for the survey are those on which the DNR and WCWP wanted initial guidance. Most are broad topics that form a context for an ecosystem-based approach to management:

- People's perceptions of quality of life and its relation to the environment.
- People's preferences for the principles that guide future choices and the directions they would like those choices to lead.
- People's perceptions on the types and severity of land use and environmental/natural resource problems.

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[1] *Individuals and organizations that form the Wells Creek Watershed Partnership: Residents of Goodhue County and Belvidere, Featherstone, Florence, Hay Creek, Goodhue, and Mt. Pleasant Townships; the Frontenac Sportsmen's Club; Frontenac State Park Association; the Soil and Water Conservation District; Natural Resources Conservation Service; Minnesota Department of Natural Resources; Minnesota Pollution Control Agency; Minnesota Board of Water and Soil Resources; and area businesses.*

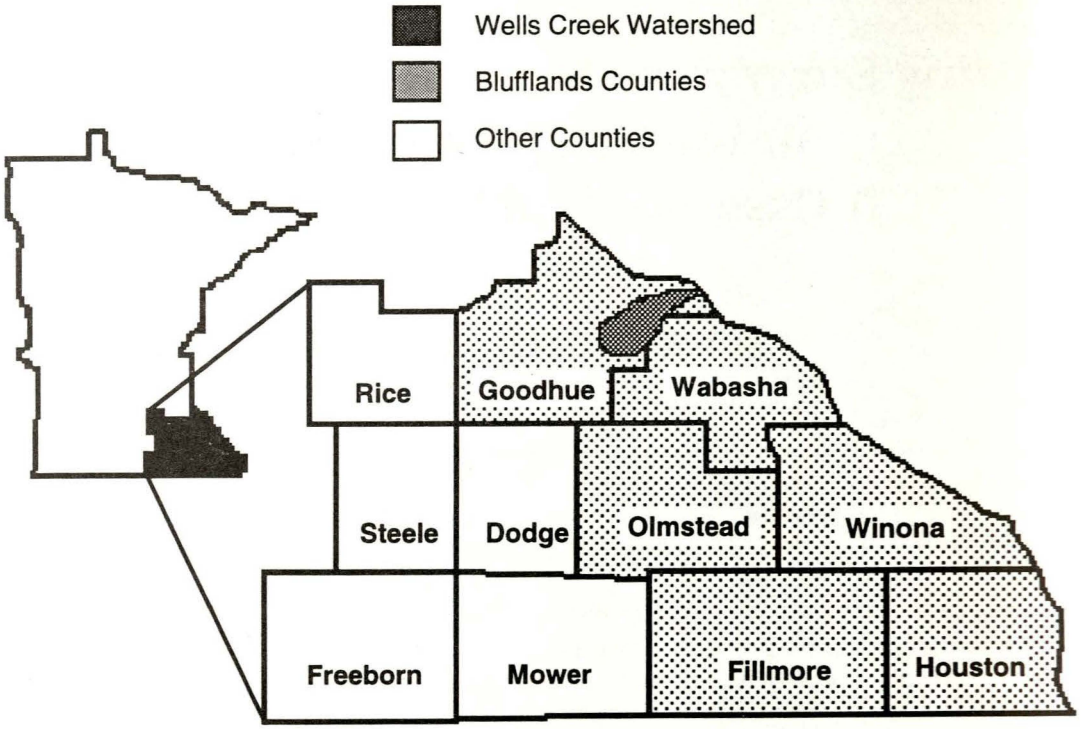

Figure 1.—*Southeastern Minnesota counties.*

- Actions people take to affect environmental quality and land use.
- Sources of information people use to find out about land use and the environment.

This report summarizes the survey findings. After a brief discussion of methodology and the survey area, we present the topics in the order listed above. More detail can be found in Appendix B, which includes tabulations broken down by geographic area (Wells Creek watershed, bluffland counties, and other counties in southeastern Minnesota) and type of residential location (farm, rural/nonfarm, and city/town).

The survey was administered and analyzed by staff of the DNR and the North Central Forest Experiment Station (NCFES), USDA Forest Service. The NCFES provided funding for administering the survey.

METHODOLOGY

After a pretest in February 1994, the survey was mailed to the full sample in March 1994. It was remailed twice in April 1994 to people who failed to respond to earlier mailings (see Appendix A for methodological detail and the survey instruments). The survey has three geographic areas for summarizing results: (1) Wells Creek watershed, (2) bluffland counties, and (3) remaining counties in southeast Minnesota (fig. 1). Wells Creek residents were identified from county land assessor records, and every property owner there was included in the survey. For the latter two areas, a sample of names and addresses was purchased from Survey Sampling, Inc. Names were systematically selected from a zip-code sorted file.

The sample size was 490 for Wells Creek and 1,000 for each of the other two areas. The return rate for the survey was 57 percent, a rate typical of a general population survey of

this type. For the three survey areas, the return rate ranged from 54 to 62 percent. Wells Creek residents had the highest return rate.

Because the sampling rates in the different areas were not the same, survey results were weighted by the number of property owners in the Wells Creek watershed and by the number of households (1990 U.S. Census) in the other two areas. Weighting ensures that responses from an area are appropriately represented when combined with responses from a different area.

The response rate of 57 percent was not considered sufficiently high (above 70 percent) to allay concern about potential nonresponse bias, which is the possibility that the 43 percent of residents who did not respond to the survey think differently from those who did respond. To examine this possibility, we surveyed 100 nonrespondents by telephone and concluded that the mail respondents appear to provide a reasonable representation of opinions of all residents in the target area (see Appendix A for a fuller discussion).

FINDINGS

The Region and Its People

Agriculture dominates the landscape of southeastern Minnesota, where some of the most productive agriculture lands in North America are located (fig. 2)[2]. Most of the remainder of the southeast region is a mix of forest cover and pasture/open lands. Forest cover is most common along the stream valleys in the more rugged eastern part of the region. Very little land is devoted to urban uses.

Wells Creek is a small (52,000 acres) watershed characteristic of the eastern part of the region. Forest and grasslands are found primarily along the rugged stream valleys, while cultivated land dominates the more gently sloping uplands. Overall, cultivated

[2]*The 1969 land use/cover data for the entire region come from the Minnesota Land Management Information System and are available through the Land Management Information Center (LMIC), Minnesota State Planning Agency.*

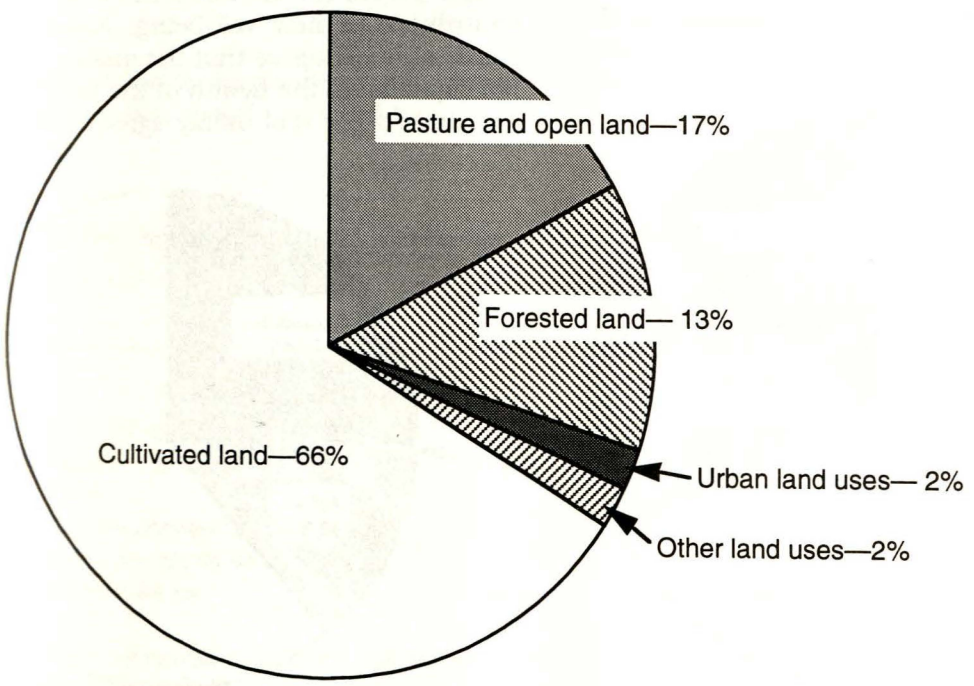

Figure 2.—*Land use/land cover in the survey area of southeastern Minnesota.*

land makes up 62 percent of the watershed. Forest covers 25 percent and grasslands, either along or intermixed with shrubs and trees, cover 10 percent. Only 2 percent of the land is urban or built up for farmsteads or rural residences.

Although the landscape is primarily agricultural, most of the residents of the region describe themselves as living in cities and towns (fig. 3). Few live on farms. In the Wells Creek watershed, however, farmers make up more than half (54 percent) of the residents, and city/town residents are the minority at 16 percent.

Most of the people have lived in the region for a long time and, as a result, should be knowledgeable about conditions in the region (fig. 4). Nearly 80 percent of respondents have resided in the region for more than 20 years. Of those living on farms, more than 90 percent have resided in the area for more than 20 years. The Wells Creek watershed, consistent with its larger portion of farmers, has a larger portion of 20+ year residents (87 percent).

Quality of Life and its Relation to the Environment

Most respondents (86 percent) judge their quality of life as good to excellent (fig. 5). Few judge it as poor. Farmers, rural dwellers, and city residents differ little in their perception of quality of life. Wells Creek residents judge their quality of life slightly higher than do their regional neighbors. As a further demonstration of satisfaction with their quality of life where they live, nearly everyone (98 percent) wants to remain living where they now reside.

People believe the environment is an important contributor to their well-being. Nearly two-thirds strongly agree that the quality of their life depends on the health of the environment, and most of the rest mildly agree (table 1).

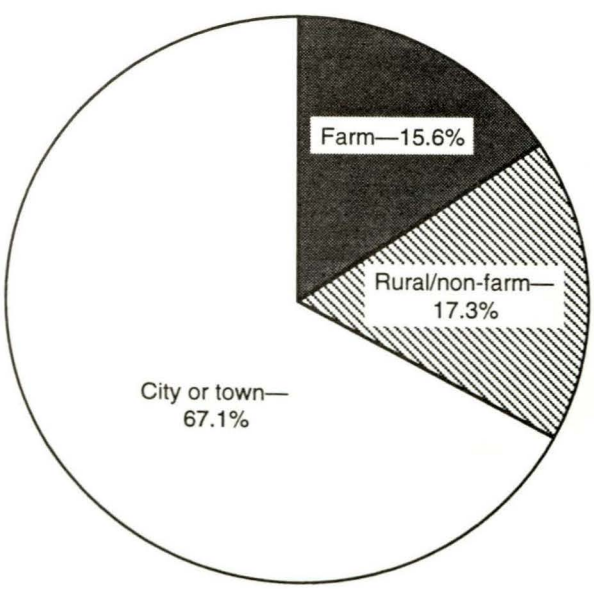

Figure 3.—*Respondents' answers to the question: Where do you live?*

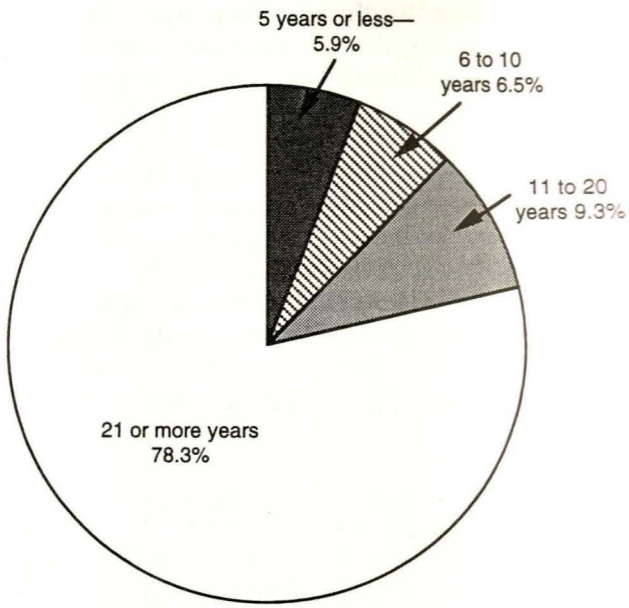

Figure 4.—*Number of years respondents have resided in southeastern Minnesota.*

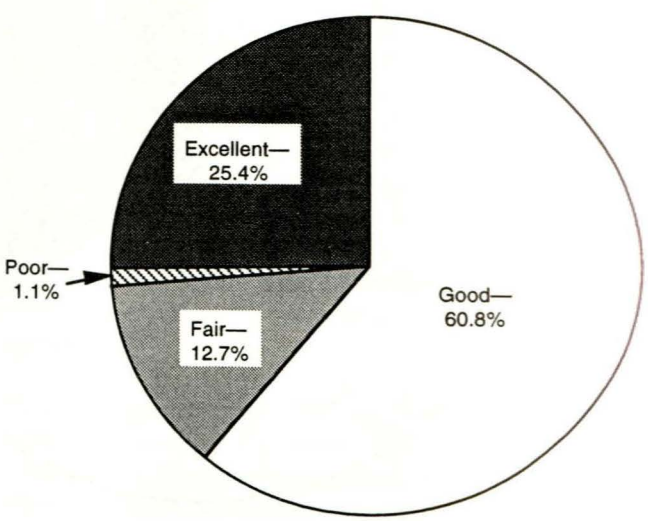

Figure 5.—*Respondents' answers to the question: How would you rate the general quality of life in your community?*

Table 1.—*Importance of environment to well-being*

Statement	Strongly agree	Mildly agree	Neutral	Mildly disagree	Strongly disagree	Don't know
	Percent of respondents					
My quality of life depends on the health of the environment.	64.0	23.1	6.8	2.0	1.3	2.8
A healthy economy depends on a health environment.	45.8	30.8	12.7	4.7	3.5	2.4

More than three-quarters also agree that a healthy economy (a component of general well-being) depends on a healthy environment. A high level of agreement with these statements is shared among farmers, rural dwellers, and city residents. Agreement is as prevalent in the Wells Creek watershed as elsewhere.

Future Choices

Because public support is needed to effectively implement management actions, the survey gathered information on the broad principles that people use to guide decisions about the future. In addition, it examined how people would like the landscape to change.

Principles

When making choices, people want to balance the various components of their well-being, and they are reluctant to sacrifice one component of their well-being to achieve another. Most do not believe in achieving economic development at the expense of a degraded environment (table 2). At the same time, the majority agree that achieving an environmental goal such as preserving rare plants and animals (a goal not normally considered as cost conscious as other environmental goals) needs to be weighed against the costs of doing so. The whole mix of what needs to be balanced has a temporal dimension as well, for many respondents believe we should limit current environmental use and development so future generations will have the resources they need to live. There is widespread support among farmers, rural residents, and city/town dwellers, and throughout the survey areas, for this idea of balancing components of well-being.

Table 2.—*Balancing components of well-being*

Statement	Strongly agree	Mildly agree	Neutral	Mildly disagree	Strongly disagree	Don't know
	Percent of respondents					
Sometimes it is OK to degrade the environment to promote economic development.	3.8	14.1	12.7	24.4	41.0	4.0
Cost should be an important consideration in making decisions on preserving rare plants and animals.	22.4	33.3	12.1	14.7	13.2	4.3
We should limit our development and use of the environment today so that future generations will have the resources they need to live.	51.3	30.1	7.4	4.9	2.4	3.9

Related to the need to balance environmental protection and economic well-being, people want to be able to weigh the costs and benefits to the economy, the environment, and future generations before choosing a course of action. It is a challenge for public agencies whose mission has been traditionally limited to just one component of people's well-being (such as the economy or environment) to participate in, and produce information for, a more comprehensive process such as the one people appear to want.

In terms of a process to plan for the future, more than 80 percent of respondents agree with the idea of developing community goals as an important step in maintaining environmental quality (table 3). Even more respondents agree that citizens, and not just resource professionals, need to be involved in developing public policies on environmental quality and land use. Presumably the need for citizen input extends to community goal setting as well.

Compared to other respondents, farmers and residents of the Wells Creek watershed (which has many farmers) agree slightly less with the notion of community goal setting, but they are still in strong agreement with the idea. The importance of citizen participation in policy formation is supported across the board.

Direction

People would like to see more natural features (e.g., forests) on the landscape (table 4). The only natural feature about which they are ambivalent concerns pre-European settlement plant communities. This item elicited a relatively high "don't know" response. In another part of the survey, the "pre-European settlement plant community" level is associated with a similar response. Apparently, people are confused by the label and this confusion may contribute to their ambivalence. It is important to note that the last item under natural landscape features is phrased in reverse fashion from the others, so a "less" response to "length of rivers or streams straightened or channeled" means more natural features.

Farmers and Wells Creek watershed residents lean in the same direction as others in terms of desiring more natural landscape features, but they lean less strongly so.

Respondents would also like more aesthetic attributes and outdoor recreation opportunities. Once again, farmers and Wells Creek watershed residents are somewhat less inclined than other people to want more of these, although they still lean toward wanting more.

People are evenly split about devoting more or less forest land to wood products industries. Farmers and Wells Creek watershed residents lean more heavily toward wanting more forest land devoted to industry.

Table 3.—*Planning principles*

Statement	Strongly agree	Mildly agree	Neutral	Mildly disagree	Strongly disagree	Don't know
	Percent of respondents					
An important step in maintaining environmental quality is to develop community goals for the environment in our region.	49.3	31.3	10.1	2.4	1.5	5.4
Public policies that influence land use and environmental quality should be developed by resource professionals with little input from citizens.	3.0	6.2	4.5	19.3	61.9	5.1

Table 4.—*Would you like to see less, more, or about the same of each item in your region?*

	More	About the same	Less	Don't know
	- - - - - *Percent of respondents* - - - - -			
Natural Landscape Features				
Area of natural cover, including forests, woodlands, prairies, and wetlands	56.1	38.8	1.3	3.7
Area of wetlands that have been restored or conserved	49.8	33.2	7.0	10.1
Area of river flood plains that have been maintained or restored to their natural state, free of structures	46.9	38.3	4.3	10.6
Area devoted to the protection of rare plant and animal species	35.5	46.6	9.1	8.8
Area of pre-European settlement plant communities that are being conserved or have been restored	16.9	44.2	11.0	28.0
Length of rivers or streams that have been straightened or channeled	7.9	36.1	38.4	17.7
Aesthetic and Outdoor Recreation Use				
Areas in towns and cities planted to trees and shrubs	76.0	20.2	0.6	3.2
Number of recreation areas devoted to non-motorized outdoor recreation	48.8	38.0	7.3	5.9
Urban and Industrial Use				
Areas of forest devoted to supporting the local wood products industries	29.2	36.5	21.4	12.8
Area of new light industrial development in rural areas	17.5	35.9	37.8	8.8
Area of new residential development in rural areas	5.1	34.0	54.6	6.3

On balance, respondents would like to see less new light industrial and residential development in rural areas. This is especially true of rural/nonfarm and Wells Creek residents. In another part of this survey, the majority of people indicate that they would like to see new residential development restricted to areas adjacent to existing urban centers. Two-thirds of Wells Creek residents support this idea.

Problems

Respondents were asked to indicate the types and severity of land use and environmental problems that exist in their area. This was done in an open-ended question and in a structured question.

In the open-ended question, people were asked to list the two most pressing land use and environmental problems in their region. Responses are split about evenly between those who identify an environmental problem (63.8 percent) and those who identify a land use problem (55.7 percent) (table 5). Within environmental and natural resource problems, problems related to water (water quality, quantity, and timing) are the major concern. After water, natural areas are the next most frequently mentioned problems. Wells Creek residents mention the management and use of natural areas less, mainly because they do not view the quality or quantity of wetlands and wildlife habitat as pressing a problem as other people. Soil erosion is the leading problem farmers identify, and it is a major issue even among rural and city/town residents.

Agriculture is the leading category of land use problems, especially among farmers. Within agriculture, soil erosion is the top concern, followed by chemical use and farm practices. Soil erosion is treated here both as a land use problem and an environmental/natural resource problem, because erosion is an agricultural practice issue (land use problem) and leads to a diminished resource (natural resource problem). Except for soil erosion, none of the items fit well under both types of problems.

Table 5.—*What are the two most pressing land use or environmental problems in your region*[1]*?*

	Overall	Where do you live?			Location of residence		
		Farm	Rural/ non-farm	City or town	Wells Creek	Bluffland counties	Other counties
Environmental and Natural Resource Problems	63.8	58.5	66.6	64.2	51.7	65.1	61.6
Water quality and quantity	35.4	20.0	39.9	37.7	30.3	37.1	32.6
Water quality	23.2	11.4	28.6	24.4	19.9	22.9	23.8
Ground water	7.6	4.3	8.5	8.1	8.5	8.9	5.5
Flooding	6.1	4.3	4.1	7.1	3.3	6.9	4.9
Natural areas	26.2	24.5	27.3	26.3	13.3	25.4	27.4
Wetlands	10.3	9.7	11.9	10.0	3.3	8.0	14.0
Wildlife habitat	9.0	8.9	8.5	9.1	3.3	10.0	7.3
Woodlands/natural areas	8.7	6.6	7.9	9.4	7.1	8.6	8.8
Soil erosion	19.0	31.5	19.5	16.0	18.5	20.6	16.5
Land Use Problems	55.7	63.6	53.7	54.4	54.5	56.9	53.7
Agricultural	39.9	50.7	42.1	36.8	38.4	38.3	42.4
Soil erosion	19.0	31.5	19.5	16.0	18.5	20.6	16.5
Chemical use	11.9	16.4	12.6	10.6	12.8	10.3	14.3
Farm practices	7.8	6.7	9.1	7.6	11.8	6.9	9.1
Fertilizer/pesticide/waste runoff	7.6	5.8	7.9	8.0	5.2	6.3	9.8
Urban	20.4	19.2	18.2	21.2	22.7	23.7	14.9
Overpopulation & housing development	15.6	14.5	15.4	15.9	18.0	18.9	10.4
City expansion	5.4	5.9	3.8	5.7	4.7	5.7	4.9

[1] Percent of respondents indicating that this was one of two of the most pressing problems

Urban problems are the other major land use category. The leading problems in this category are too many people and their associated development, plus city expansion.

There would appear to be little consensus among respondents on what the major problems are. The most frequently cited item is "water quality," selected by only 23.2 percent of respondents. This lack of consensus is due, in part, to the specificity with which the items are categorized. But it is also partly due to differences in types of items people chose to report as "problems." Some problem items (such as land use items) are causes of other problem items (such as water quality), and other problem items are intermediaries between causes and effects (wetland effects on water quality). If the question could have obtained answers for related clusters of items (related causes, effects and intermediaries), more consensus may have been found. To be sure, it is a challenge to resource professionals to ensure that people understand these linkages so they can appreciate their mutual interests even though each may define the problem somewhat differently.

The structured question on problems asks respondents to rate 15 items according to how much of a problem each is. Most, but not all, of the items are environmental/natural resource or land use items.

The most severe problem is the loss of small family farms (fig. 6) considered a serious problem by nearly 50 percent of respondents. The most serious of the environmental/natural resource items had a much lower "serious problem" response, around 25 percent.

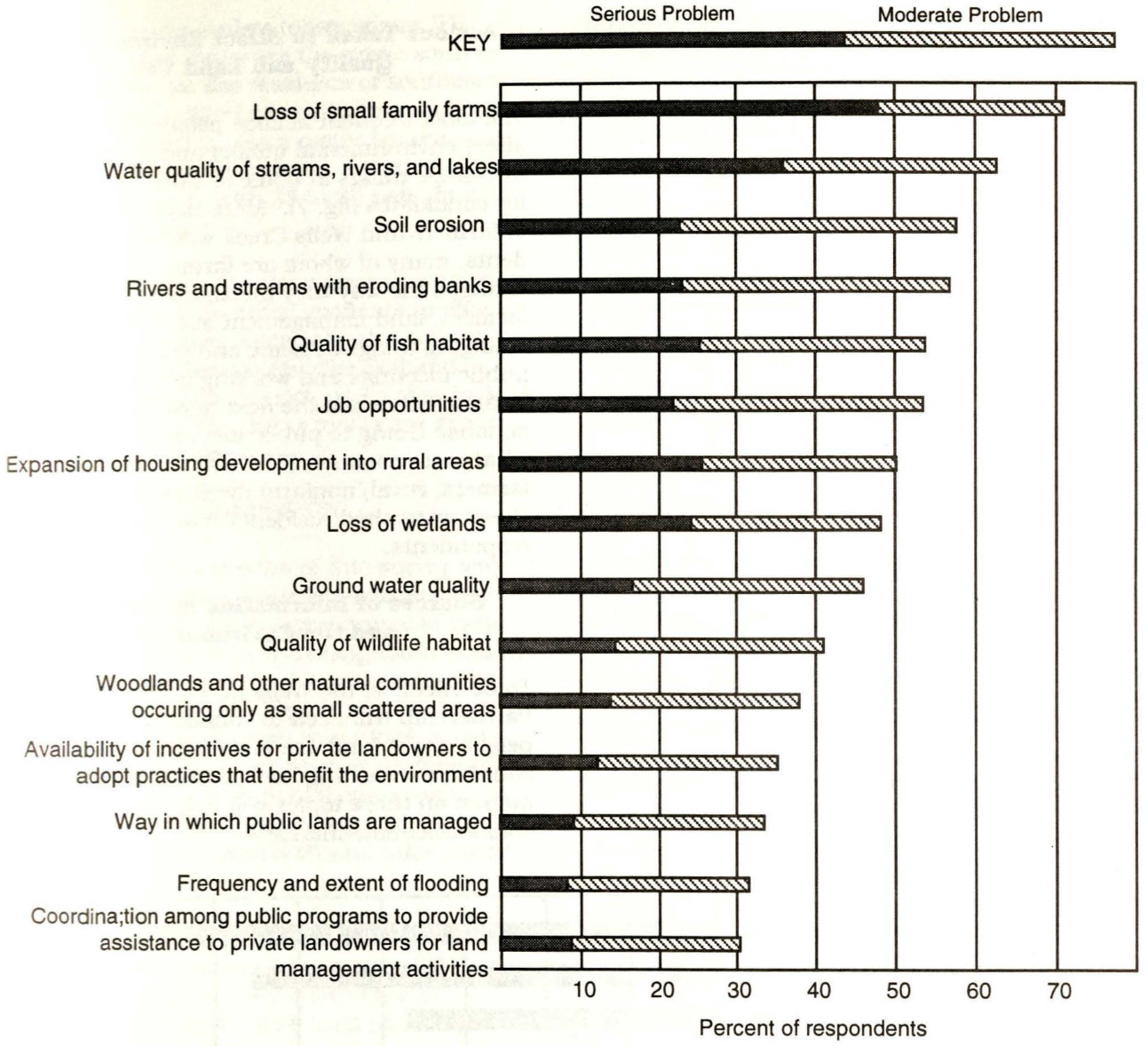
KEY
Serious Problem
Moderate Problem
Loss of small family farms
Water quality of streams, rivers, and lakes
Soil erosion
Rivers and streams with eroding banks
Quality of fish habitat
Job opportunities
Expansion of housing development into rural areas
Loss of wetlands
Ground water quality
Quality of wildlife habitat
Woodlands and other natural communities occuring only as small scattered areas
Availability of incentives for private landowners to adopt practices that benefit the environment
Way in which public lands are managed
Frequency and extent of flooding
Coordina;tion among public programs to provide assistance to private landowners for land management activities
10
20
30
40
50
60
70
Percent of respondents

Figure 6.—*How much of a problem do you think each is where you live?*

The level of seriousness attached to environmental/natural resource problems appears to indicate that such problems are of secondary importance in the hierarchy of problems confronting people. This hierarchical position is corroborated by results from the Minnesota Poll, which asked people to name the most important problem facing the State. In the most recent poll, environment (which includes natural resource concerns) was well down the list (table 6)[3]. Going back 10 years (five polls), the environment received more than 1 percent of responses only one time, and that was in the wake of the 20th anniversary of Earth Day in 1990.

Certainly the results show concern on the part of people, because 50 percent or more believe that many environmental/natural resource items are moderate to serious problems. But they do not believe such problems are the most serious. If this level of seriousness is not consistent with the views of professional resource managers, then these results are a clear call for better communications between resource professionals and the public.

[3]*The results of the Minnesota Poll for the last 10 years are presented in the Star Tribune on December 31, 1994, page 10A. Rob Daves of the Star Tribune provided additional information on the results, including the types of responses categorized under the "environment" label, and the reasons for the high "environment" response in 1990. The 1990 Minnesota Poll was conducted a few weeks after the 10th anniversary of Earth Day.*

Table 6.—*What do you think is the most important problem facing the state of Minnesota?*

Problem	Percent of adults[1]
Taxes	19
Crime	18
Education	10
Welfare system	6
Economy in general	5
Health care	5
Government/politicians	4
Unemployment	3
Drugs	2
Moral values	2
Business climate	1
Farm economy	1
Family values	*
Environment	*
Budget deficit	*
Drought	0
Other	12
No opinion	12

* Less than 1 percent

[1] Responses of 1,008 adults statewide in Minnesota Poll, November/December 1994.

Actions Taken to Affect Environmental Quality and Land Use

The most frequent actions people take to affect environmental quality and land use are to change things at home or work and to vote for candidates (fig. 7). More than 60 percent of farmers and Wells Creek watershed residents, many of whom are farmers, have changed the way they manage their land. For farmers, land management substitutes for changing things at home and work. Attending public meetings and working in community/local activities are the next most frequent actions. Going to public meetings is somewhat more common (30 to 36 percent) among farmers, rural/nonfarm dwellers, and Wells Creek watershed residents than among other respondents.

Sources of Information on Land Use and the Environment

To be effective, the Wells Creek Watershed Partnership will need to communicate with people about land use and environmental concerns. Learning how people receive information on these topics will help to target communication channels.

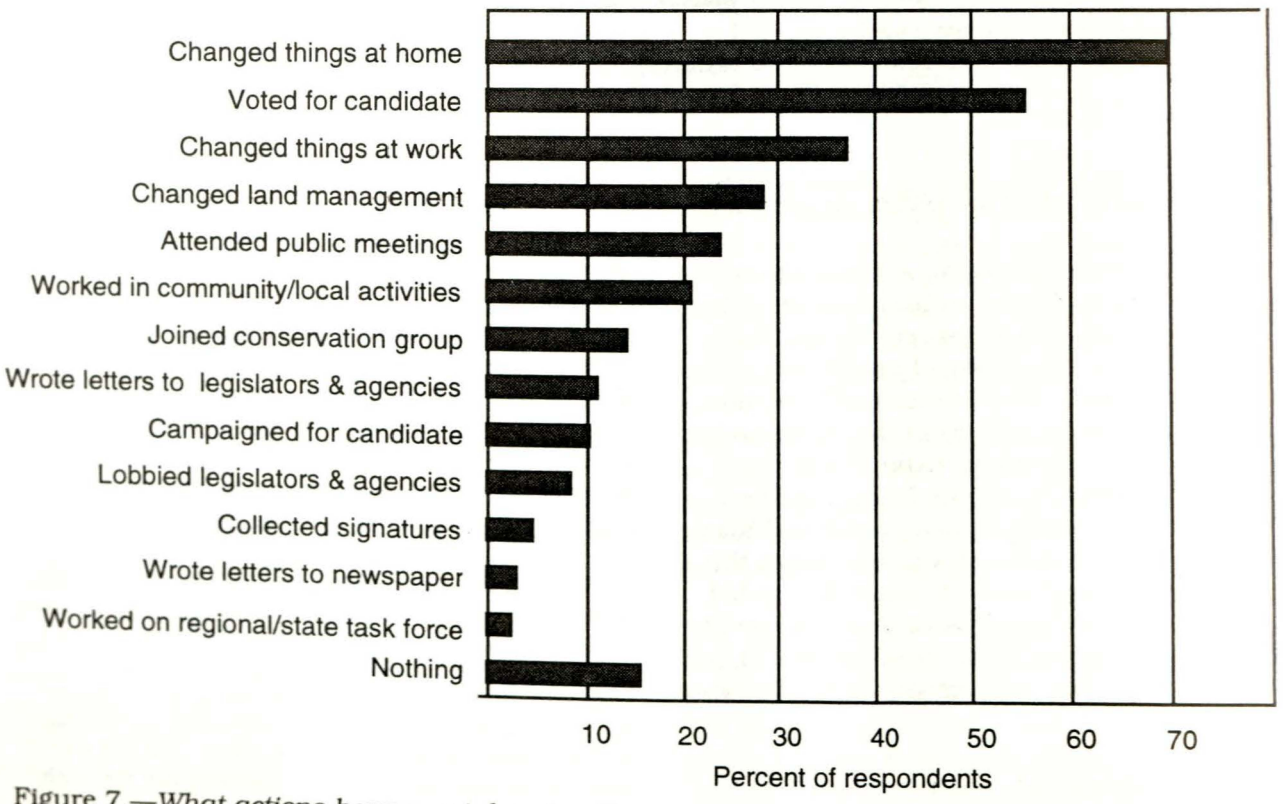

Figure 7.—*What actions have you taken to affect environmental quality and land use in your region?*

The major media outlets (newspapers, TV, magazines, and radio) are the prime sources of information for the residents of southeastern Minnesota. Word of mouth (from friends, others, or family) is also a major source. Information from government organizations is in a middle group, with 25 to 35 percent of respondents using it.

Farmers and Wells Creek watershed residents are more likely than other residents to chose government sources, especially the Agricultural Extension Service and the Soil and Water Conservation District, when they look for information. The major media are generally less used sources.

DISCUSSION

We are finding the results of this survey very useful in informing resource managers and area residents about the importance of various resource issues to their neighbors, and in helping direct or target other citizen involvement activities. In the Wells Creek Watershed, the Partnership's steering committee is using results from the survey to better understand the breadth of environmental concerns in the watershed and the depth of support for specific approaches to outreach and information sharing.

Results from the surveys conducted in Wells Creek as well as in the other parts of the region are being used by staff of the State DNR to correct myths they hold about residents' perceptions of the environment and natural resource management in southeastern Minnesota. Those survey results are helping them to better understand their employers' (the citizens of Minnesota) values, wants, and needs and to develop educational and outreach efforts for DNR programs and activities.

In 3 to 5 years, when many of the initial outreach efforts are completed, we will resurvey residents of southeastern Minnesota to see if we can distinguish any changes in the perceptions, values, and beliefs of citizens in Wells Creek (as compared to the rest of the region) and whether we can attribute these changes to the intensive outreach efforts.

Looking back over the questionnaire, we see several things we might do differently if we were to do this again. For example, we were very careful to avoid using ecosystem management jargon in the survey so that we could be sure that people understood the questions. Yet, if we are interested in measuring the success of the Wells Creek Watershed Partnership in educating citizens on ecosystem management, we should have had some questions that used the jargon—terms such as "ecosystem management," "sustainability," and "biodiversity"—to establish a basis of comparison with subsequent surveys. It also would have been interesting to survey the Minnesota DNR staff to see if their values and perceptions represent those of the residents, or to ask the staff to predict how residents would respond so that we could test for any myths about land management and use in the region.

APPENDIX A

Methodology

The survey was pretested on a sample of 100 in February 1994. The pretest led to minor changes in the survey instrument. The survey was mailed to the full sample in March 1994 and remailed twice in April 1994 to people who failed to respond to earlier mailings.

The survey has three geographic areas for summarizing results: (1) Wells Creek watershed, (2) bluffland counties, and (3) remaining counties in southeast Minnesota (fig. 1). We identified Wells Creek residents from county land assessor records and included every property owner there in the survey. For the latter two geographic areas, a sample of names and addresses was purchased from Survey Sampling, Inc. Names were systematically selected from a zip-code sorted file. The Wells Creek residents also in the bluffland county sample were excluded from the bluffland sample.

The sample size was 490 for Wells Creek and 1,000 for each of the other two areas (table 7). The bluffland counties had five duplicates with Wells Creek residents, so the actual sample size for the bluffland counties was 995. The sample sizes for the two areas outside of Wells Creek were selected to ensure at least 100 responses from farmers.

All together, 2,485 surveys were mailed out. Some could not be delivered for various reasons (e.g., person moved). Of those that could be delivered, 57 percent were returned, a return rate that is typical of a general population survey of this type. For the three survey areas, the return rate ranged from 54 to 62 percent. Wells Creek residents had the highest return rate at 62 percent.

We weighted survey results by the number of property owners in the Wells Creek watershed and by the number of households (1990 U.S. Census) in the other two areas, because the sampling rates in the different areas were not the same. Weighting ensures that responses from an area are appropriately represented when combined with responses from a different area.

The response rate of 57 percent was not considered sufficiently high (above 70 percent) to allay concern about potential nonresponse bias, which is the possibility that the 43 percent who did not respond to the survey think differently than those who did respond. To examine this possibility, we performed a nonresponse telephone survey on 100 nonrespondents, who had been systematically selected from a zip-code sorted file. The nonresponse survey included a sampling of questions from the main survey and covered all of the survey themes.

From the nonresponse survey, we concluded that the mail respondents appear to reasonably represent opinions of all residents in the target area. In most cases, respondents and nonrespondents showed either small differences or slight shifting of opinions along a spectrum. An example of the latter is the case where the major difference between respondents and nonrespondents is the portion who strongly agree with a statement and those in the adjacent response class who slightly agree.

In the few instances where there were substantial differences, we believe those differences have more to do with the survey technique (phone versus mail) than with any real differences between respondents and nonrespondents. People, in general, are more

Table 7.—*Disposition of mailed surveys*

Geographic area	Number mailed out initially	Number deliverable	Number returned	Percent returned[1]
Wells Creek	490	484	302	62.4
Bluffland counties	995	930	530	57.0
Other counties	1,000	938	506	53.9
Total	2,485	2,352	1,338	56.9

[1] Percent returned is based on number deliverable.

likely to respond with opinions and actions that reflect well on themselves when talking to another person than when filling out an anonymous mail survey. We believe this explains why a much larger portion of people contacted by telephone reported that they voted, attended public meetings, and did other civic-minded tasks than those who responded to the mail survey. However, the order among tasks from most frequently to least frequently performed was basically the same in mail and phone surveys. These systematic differences support our belief that the principal cause was probably the survey technique.

Mail Survey

SECTION A—ENVIRONMENTAL CONCERNS IN YOUR REGION

Below are some concerns about environmental quality and land use in your region. How much of a problem do you think each is where you live? (circle your answer)

	Not a problem	Slight problem	Moderate problem	Serious problem	Don't know
Water quality of streams, rivers, and lakes	NP	SLP	MP	SP	DK
Ground water quality	NP	SLP	MP	SP	DK
Frequency and extent of flooding	NP	SLP	MP	SP	DK
Loss of wetlands	NP	SLP	MP	SP	DK
Soil erosion	NP	SLP	MP	SP	DK
Quality of fish habitat	NP	SLP	MP	SP	DK
Quality of wildlife habitat	NP	SLP	MP	SP	DK
Woodlands and other natural communities occurring only as small scattered areas	NP	SLP	MP	SP	DK
Expansion of housing development into rural areas	NP	SLP	MP	SP	DK
Job opportunities	NP	SLP	MP	SP	DK
Way in which public lands are managed	NP	SLP	MP	SP	DK
Availability of incentives for private landowners to adopt practices that benefit the environment	NP	SLP	MP	SP	DK
Coordination among public programs to provide assistance to private landowners for land management activities	NP	SLP	MP	SP	DK
Loss of small family farms	NP	SLP	MP	SP	DK
Rivers and streams with eroding banks	NP	SLP	MP	SP	DK

SECTION B—PLACES YOU GO FOR INFORMATION ON LAND USE AND THE ENVIRONMENT

If you have questions about land use and the environment there are many places you can turn for information. Please look over the list below, and check the sources you've used to obtain information on land use and the environment. (check all that apply)

____ Federal offices (for example the Fish and Wildlife Service, Soil Conservation Service, and others)
____ State offices (for example the Department of Natural Resources and the Pollution Control Agency, and others)
____ County or township offices (for example planning and zoning boards)
____ Soil and Water Conservation District Offices
____ Agricultural Extension Service
____ TV
____ Radio
____ Newspapers
____ Magazines
____ Conservation or environmental groups
____ Local civic groups
____ Libraries
____ Family members
____ Friends and other people
____ Other, please specify _____

SECTION C—ACTIONS YOU'VE TAKEN TO AFFECT ENVIRONMENTAL QUALITY AND LAND USE

There are many different things you can do to affect environmental quality and land use in your region. Please consider the list below and indicate all the actions you have taken to affect environmental quality and land use.

To affect environmental quality and land use in my region, I have... (check all that apply)

____ ... campaigned for a candidate with views similar to mine.
____ ... voted for candidates with views similar to mine.
____ ... phoned or personally lobbied legislators or agency officials.
____ ... written letters to legislators or public agency officials.
____ ... written letters to newspapers.
____ ... worked on regional or state panels or task forces.
____ ... taken part in community or local projects or activities.
____ ... gone to public meetings.
____ ... joined a conservation group.
____ ... collected signatures for a petition.
____ ... changed some things I do in my home.
____ ... changed some of the practices where I work.
____ ... changed the way I manage my land.
____ Other (please specify) _____

____ I have not taken any specific action related to the environment.

SECTION D—YOUR RELATION TO THE ENVIRONMENT

Below are several statements that describe your relationship to the environment. Please indicate how much you agree or disagree with each statement. (circle one response to each question)

	Strongly disagree	Mildly disagree	Neither agree nor disagree	Mildly agree	Strongly agree	Don't know
My quality of life depends on the health of the environment.	SD	MD	N	MA	SA	DK
An important step in maintaining environmental quality is to develop community goals for the environment in our region.	SD	MD	N	MA	SA	DK
Public policies that influence land use and environmental quality should be developed by public resource professionals with little input from citizens	SD	MD	N	MA	SA	DK
Sometimes it is OK to degrade the environment to promote economic development.	SD	MD	N	MA	SA	DK
A healthy economy depends on a healthy environment.	SD	MD	N	MA	SA	DK
Cost should be an important consideration in making decisions on preserving rare plants and animals.	SD	MD	N	MA	SA	DK
We should limit our development and use of the environment today so that future generations will have the resources they need to live.	SD	MD	N	MA	SA	DK
Conserving and restoring pre-European settlement plant communities should be an important goal of public land management agencies.	SD	MD	N	MA	SA	DK
Economic development activities in my region should focus on diversifying the economy.	SD	MD	N	MA	SA	DK
When managing public lands, the economic health of my community should be given highest priority.	SD	MD	N	MA	SA	DK
River flood plains should exist in a natural state, free of buildings or other structures	SD	MD	N	MA	SA	DK
We should maintain or enhance the diversity of wildlife populations	SD	MD	N	MA	SA	DK
Private landowners and public land managers currently work together effectively to protect the environment.	SD	MD	N	MA	SA	DK
New residential development should be restricted to areas adjacent to existing urban centers.	SD	MD	N	MA	SA	DK
We should maintain or enhance the diversity of natural plant communities.	SD	MD	N	MA	SA	DK

SECTION E—FUTURE ENVIRONMENTAL CONDITIONS

Please consider each statement below and indicate whether you would like to see less, more, or about the same of each in your region. (circle one answer for each statement)

	Would like to see less	Would like to see about the same	Would like to see more	Don't know
Area of natural cover, including forests, woodlands prairies, and wetlands	Less	Same	More	DK
Area of new residential development in rural areas	Less	Same	More	DK
Area devoted to the protection of rare plant and animal species	Less	Same	More	DK
Area of pre-European settlement plant communities that are being conserved or have been restored	Less	Same	More	DK
Area of new light industrial development in rural areas	Less	Same	More	DK
Area of public land managed using techniques that attempt to imitate nature	Less	Same	More	DK
Length of rivers or streams that have been straightened or channeled	Less	Same	More	DK
Area of wetlands that have been restored or conserved	Less	Same	More	DK
Number of recreation areas devoted to non-motorized outdoor recreation	Less	Same	More	DK
Area of river flood plains that have been maintained or restored to their natural state, free of structures	Less	Same	More	DK
Areas in towns and cities planted to trees and shrubs	Less	Same	More	DK
Areas of forest devoted to supporting the local wood products industries	Less	Same	More	DK

SECTION F—SOME INFORMATION ABOUT YOU

In your opinion, what are the two most pressing land use or environmental problems in your region?

1. _____

_____

2. _____

_____

How long have you lived in southeastern Minnesota? (please circle one)

LESS THAN 1 YEAR	1-5 YEARS	6-10 YEARS	11-20 YEARS	MORE THAN 20 YEARS

Would you like to continue to reside in the area? (please circle one) YES NO

How would you rate the general quality of life in your community? (please circle one)

EXCELLENT GOOD FAIR POOR DON'T KNOW

What do you like most about living in your area?

_____

_____

What do you like least about it?

_____

_____

Where do you live? (please circle one) FARM RURAL NON-FARM CITY OR TOWN

Do you earn any income from farming? (please circle one) YES NO

Do you live on a lake shore or river front? (please circle one) YES NO

Nonresponse Telephone Survey

Survey ID Number: _____

1. First, I will read you a few statements about your relationship to the environment. After you've heard each statement, please indicate whether you strongly disagree, mildly disagree, mildly agree, strongly agree, or neither agree nor disagree with the statement.

	Strongly disagree	Mildly disagree	Neither agree nor disagree	Mildly agree	Strongly agree	Don't know
A healthy economy depends on a healthy environment	SD	MD	N	MA	SA	DK
Cost should be an important consideration in making decisions on preserving rare plants and animals.	SD	MD	N	MA	SA	DK
When managing public lands, the economic health of my community should be given highest priority	SD	MD	N	MA	SA	DK
River flood plains should exist in a natural state, free of buildings or other structures	SD	MD	N	MA	SA	DK
Private landowners and public land managers currently work together effectively to protect the environment.	SD	MD	N	MA	SA	DK
New residential development should be restricted to areas adjacent to existing urban centers.	SD	MD	N	MA	SA	DK
We should maintain or enhance the diversity of natural plant communities.	SD	MD	N	MA	SA	DK

2. As a final question, I will read you a few actions that people sometimes take to affect environmental quality and land use. After you've heard each action, please indicate whether you have or have not taken this action to affect environmental quality and land use in your region

Have you . . .

... campaigned for a candidate with views similar to yours?	Yes	No	Don't Know
... voted for candidates with views similar to yours?	Yes	No	Don't Know
... written letters to legislators or public agency officials?	Yes	No	Don't Know
... written letters to newspapers?	Yes	No	Don't Know
... gone to public meetings?	Yes	No	Don't Know
... changed the way you manage your land.	Yes	No	Don't Know

THAT'S ALL. THANK-YOU FOR YOUR COOPERATION

APPENDIX B

List of Tables

Table 8.—Below are some concerns about environmental quality and land use in your region. How much of a problem do you think each is where you live? Percentages shown by where respondents live and by location of residence.

Table 9.—If you have questions about land use and the environment there are many places you can turn for information. Please look over the list below, and check the sources you've used to obtain information on land use and the environment. Percentages shown by where respondents live and by location of residence.

Table 10.—There are many different things you can do to affect environmental quality and land use in your region. Please consider the list below and indicate all the actions you have taken to affect environmental quality and land use. Percentages shown by where respondents live and by location of residence.

Table 11.—Below are several statements that describe your relationship to the environment. Please indicate how much you agree or disagree with each statement. Percentages shown by where respondents live and by location of residence.

Table 12.—Please consider each statement below and indicate whether you would like to see less, more, or about the same of each in your region. Percentages shown by where respondents live and by location of residence.

Table 13.—Responses to open-ended questions relating to pressing land use problems and likes and dislikes about living in the area. Answers given by at least 5 percent of the respondents are reported. Percentages shown by where respondents live and by location of residence.

Table 14.—Responses to questions relating to stability of the area population—how long they have lived in the region and whether they would like to continue living in the region. Percentages shown by where respondents live and by location of residence.

Table 15.—Personal characteristics of respondents. Percentages shown by where respondents live and by location of residence.

Table 8.—*Below are some concerns about environmental quality and land use in your region. How much of a problem do you think each is where you live? Percentages shown by where respondents live and by location of residence.*

(In percent)

Response	Total	Where do you live?			Location of residence		
		Farm	Rural non-farm	City or Town	Wells Creek	Bluffland counties	Other counties
Water quality of streams, rivers, and lakes							
Not a problem	10.4	23.1	6.3	8.6	12.5	10.3	10.6
Slight problem	20.4	28.3	23.9	17.7	22.0	21.0	19.6
Moderate problem	36.4	27.9	33.8	39.1	39.3	36.3	36.3
Serious problem	26.9	16.8	30.0	28.4	22.0	26.5	27.9
Don't know	5.8	3.9	6.1	6.2	4.1	5.9	5.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Groundwater quality							
Not a problem	17.8	30.1	16.9	15.2	21.0	15.4	25.5
Slight problem	25.6	29.9	26.5	24.4	25.4	25.6	25.5
Moderate problem	29.5	24.2	27.5	31.3	29.5	30.8	27.1
Serious problem	17.2	10.7	22.6	17.2	19.7	18.9	15.2
Don't know	9.9	5.2	6.5	11.8	4.4	9.2	10.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Frequency and extent of flooding							
Not a problem	27.0	39.0	28.1	24.0	38.8	25.0	30.1
Slight problem	38.4	41.1	36.1	38.4	33.3	39.3	36.9
Moderate problem	23.3	13.1	22.0	25.9	20.7	25.0	20.7
Serious problem	8.6	6.2	10.4	8.7	5.1	8.7	8.4
Don't know	2.7	0.5	3.4	3.0	2.0	1.9	3.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Loss of wetlands							
Not a problem	20.4	45.3	19.1	15.0	41.0	22.0	17.7
Slight problem	20.0	23.3	17.5	19.8	22.2	18.7	21.7
Moderate problem	24.1	12.5	29.0	25.5	16.7	23.6	24.9
Serious problem	24.5	13.5	26.9	26.3	12.6	24.5	24.7
Don't know	11.0	5.4	7.5	13.3	7.5	11.2	10.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Soil erosion							
Not a problem	6.7	13.3	4.1	5.8	9.8	5.2	8.9
Slight problem	24.2	32.9	28.8	21.0	35.1	23.9	24.6
Moderate problem	34.9	29.3	41.2	34.6	34.5	35.7	33.5
Serious problem	23.3	21.7	21.6	24.1	18.9	25.3	20.6
Don't know	10.8	2.8	4.3	14.4	1.7	9.8	12.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Quality of fish habitat							
Not a problem	10.5	26.2	8.8	7.4	17.5	10.8	10.1
Slight problem	18.2	18.2	19.5	17.8	16.4	18.7	17.2
Moderate problem	28.6	26.5	31.1	28.5	33.2	29.9	26.2
Serious problem	25.8	14.0	26.8	28.2	20.2	25.4	27.0
Don't know	16.9	15.1	13.8	18.1	12.7	15.2	19.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(Table 8 continued on next page)

(Table 8 continued)

Response	Total	Where do you live?			Location of residence		
		Farm	Rural non-farm	City or Town	Wells Creek	Bluffland counties	Other counties
Quality of wildlife habitat							
Not a problem	23.8	45.8	20.6	19.5	41.0	26.5	19.4
Slight problem	25.5	20.8	29.0	25.7	29.2	26.1	24.8
Moderate problem	26.6	19.4	28.7	27.7	20.0	23.7	30.9
Serious problem	14.8	9.9	16.2	15.5	6.8	14.8	14.8
Don't know	9.3	4.1	5.5	11.6	3.1	8.9	10.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Woodlands and other natural communities occurring only as small scattered areas							
Not a problem	21.8	43.4	17.6	17.8	38.8	24.1	18.0
Slight problem	24.6	20.9	28.7	24.3	24.7	24.5	24.8
Moderate problem	24.0	16.0	27.7	24.9	17.9	22.9	25.5
Serious problem	14.4	9.8	12.9	15.9	7.6	13.5	16.0
Don't know	15.2	9.8	13.2	17.1	11.0	14.9	15.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Expansion of housing development into rural areas							
Not a problem	21.3	31.6	18.5	19.8	21.8	19.5	23.8
Slight problem	21.8	16.9	24.8	22.2	21.5	20.1	24.6
Moderate problem	24.6	22.7	23.1	25.5	25.8	24.9	24.0
Serious problem	25.9	26.4	30.4	24.5	28.2	30.5	19.0
Don't know	6.3	2.4	3.2	8.0	2.7	5.0	8.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Job opportunities							
Not a problem	13.3	19.5	14.0	11.7	23.6	13.2	13.3
Slight problem	22.3	23.5	23.5	21.7	26.3	24.6	19.1
Moderate problem	31.5	28.5	28.2	33.1	25.9	31.4	31.5
Serious problem	22.3	19.6	24.1	22.4	13.8	20.2	25.7
Don't know	10.6	8.9	10.2	11.0	10.4	10.7	10.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Way in which public lands are managed							
Not a problem	18.4	28.6	16.6	16.5	18.8	17.9	18.8
Slight problem	28.7	22.9	35.2	28.3	31.7	29.1	27.8
Moderate problem	24.3	27.3	22.7	24.0	21.2	23.5	25.3
Serious problem	9.6	8.1	9.5	10.0	12.6	11.6	6.9
Don't know	19.0	13.0	16.1	21.2	15.7	17.9	21.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Availability of incentives for private landowners to adopt practices that benefit the environment							
Not a problem	15.6	28.0	11.7	13.8	19.5	15.9	14.8
Slight problem	19.9	24.6	19.3	18.9	29.7	22.1	16.4
Moderate problem	23.0	27.9	20.8	22.4	21.2	21.4	25.4
Serious problem	12.5	8.9	18.3	11.9	12.3	12.2	13.5
Don't know	29.0	10.5	29.9	33.0	17.4	28.3	29.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Coordination among public programs to provide assistance to private landowners for land management activities							
Not a problem	13.0	23.3	11.5	11.1	15.0	14.0	11.3
Slight problem	19.7	28.2	23.2	16.8	25.3	20.1	19.2
Moderate problem	21.5	20.7	20.9	21.9	20.8	20.7	23.1
Serious problem	9.3	11.0	14.0	7.7	14.0	9.6	8.9
Don't know	36.5	16.8	30.5	42.5	24.9	35.6	37.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(Table 8 contined on next page)

(Table 8 continued)

Response	Total	Where do you live?			Location of residence		
		Farm	Rural non-farm	City or Town	Wells Creek	Bluffland counties	Other counties
Loss of small family farms							
Not a problem	6.6	5.4	5.0	7.2	6.4	8.1	4.0
Slight problem	13.4	9.5	16.9	13.4	13.2	13.2	13.7
Moderate problem	23.1	20.8	27.1	22.6	20.9	23.4	22.5
Serious problem	48.5	63.8	41.8	46.7	56.4	46.4	52.1
Don't know	8.4	0.5	9.2	10.1	3.0	8.9	7.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Rivers and streams with eroding banks							
Not a problem	6.7	13.6	5.2	5.5	11.4	6.2	7.3
Slight problem	23.5	28.9	26.6	21.4	30.5	22.1	25.5
Moderate problem	33.8	31.2	35.7	33.8	33.6	34.0	33.5
Serious problem	23.6	19.6	23.0	24.7	20.1	25.9	20.2
Don't know	12.5	6.8	9.4	14.6	4.4	11.8	13.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 9.—*If you have questions about land use and the environment there are many places you can turn for information. Please look over the list below, and check the sources you've used to obtain information on land use and the environment. Percentages shown by where respondents live and by location of residence.*

(In percent)

Sources	Total	Where do you live?			Location of residence		
		Farm	Rural non-farm	City or Town	Wells Creek	Bluffland counties	Other counties
Federal offices	29.3	40.5	27.3	27.0	32.9	31.0	26.5
State offices	36.9	28.7	37.7	38.7	34.6	40.3	31.3
County or township offices	36.4	50.6	45.5	30.4	51.4	35.2	38.3
Soil and Water Conservation District offices	28.4	59.3	30.0	20.4	48.6	27.0	30.4
Agricultural Extension Service	29.7	62.3	30.0	21.7	55.4	26.5	34.3
Television	54.4	35.0	52.2	59.7	37.9	54.4	54.8
Radio	43.9	30.0	43.7	47.4	31.4	41.4	48.0
Newspapers	64.1	48.8	63.7	68.0	55.7	65.0	63.0
Magazines	50.3	52.1	48.6	50.3	55.0	49.5	51.7
Conservation or environmental groups	23.9	19.3	24.4	24.9	18.2	23.4	24.8
Local civic groups	8.8	4.8	8.5	9.9	10.0	8.5	9.3
Libraries	23.2	14.2	23.7	25.2	17.9	23.8	22.4
Family members	32.3	25.5	27.6	35.3	35.4	33.8	30.7
Friends and other people	48.6	37.1	50.7	50.9	46.8	49.0	48.5
Other	4.4	5.1	3.1	4.6	2.5	3.8	5.2

Table 10.—*There are many different things you can do to affect environmental quality and land use in your region. Please consider the list below and indicate all the actions you have taken to affect environmental quality and land use. Percentages shown by where respondents live and by location of residence.*

(In percent)

Action	Total	Where do you live?			Location of residence		
		Farm	Rural non-farm	City or Town	Wells Creek	Bluffland counties	Other counties
Campaigned for a candidate with views similar to mine	10.7	8.0	10.0	11.5	9.0	11.1	10.0
Voted for candidates with views similar to mine	55.9	47.3	55.3	58.1	50.3	55.3	57.0
Phoned or personally lobbied legislators or agency officials	8.7	10.7	9.3	8.1	11.5	8.9	8.5
Written letters to legislators or public agency officials	11.5	12.5	11.7	11.2	14.9	11.3	11.9
Written letters to newspapers	3.2	2.9	4.0	3.0	3.8	3.6	2.5
Worked on regional or state panels or task forces	2.6	2.1	1.9	2.8	2.8	2.2	3.1
Taken part in community or local projects or activities	21.3	17.5	24.2	21.4	23.6	21.1	21.6
Gone to a public meeting	24.2	31.1	31.6	20.6	36.1	23.9	24.5
Joined a conservation group	14.6	17.4	11.9	14.7	14.9	14.6	14.6
Collected signatures for a petition	4.7	3.4	6.5	4.5	5.2	5.5	3.3
Changed some things I do in my home	70.2	58.5	71.4	72.6	67.4	70.8	69.2
Changed some of the practices where I work	37.6	27.8	35.9	40.3	32.6	37.5	37.6
Changed the way I manage my land	28.8	65.0	38.4	17.7	58.0	29.6	27.2
Other	3.6	4.9	5.4	2.8	5.2	3.8	3.3
I have not taken any specific action related to the environment.	16.0	15.5	14.9	16.4	12.8	15.4	17.3

Table 11.—*Below are several statements that describe your relationship to the environment. Please indicate how much you agree or disagree with each statement. Percentages shown by where respondents live and by location of residence.*

(In percent)

Response	Total	Where do you live?			Location of residence		
		Farm	Rural non-farm	City or Town	Wells Creek	Bluffland counties	Other counties
My quality of life depends on the health of the environment.							
Strongly disagree	1.3	2.3	0.0	1.4	1.7	1.6	0.8
Mildly disagree	2.0	1.8	3.2	1.7	1.7	1.7	2.2
Neutral	6.8	5.1	7.3	7.1	5.1	7.2	6.1
Mildly agree	23.1	27.0	22.3	22.5	25	23.1	23.2
Strongly agree	64.0	59.5	65.7	64.7	63.7	63.9	64.2
Don't know	2.8	4.3	1.6	2.8	2.7	2.5	3.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
An important step in maintaining environmental quality is to develop community goals for the environment in our region.							
Strongly disagree	1.5	2.8	0.9	1.3	1.4	1.8	1.0
Mildly disagree	2.4	1.8	1.6	2.7	5.2	2.4	2.3
Neutral	10.1	15.3	11.2	8.6	14.5	10.5	9.5
Mildly agree	31.3	33.5	31.1	30.9	36.6	32.5	29.1
Strongly agree	49.3	35.7	52.6	51.7	37.6	48.1	51.5
Don't know	5.4	10.8	2.6	4.9	4.8	4.7	6.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Public policies that influence land use and environmental quality should be developed by resource professionals with little input from citizens.							
Strongly disagree	61.9	65.8	69.5	59.0	68.4	59.8	65.1
Mildly disagree	19.3	20.2	12.7	20.9	11.7	20.6	17.3
Neutral	4.5	2.9	7.0	4.2	5.8	5.1	3.5
Mildly agree	6.2	3.3	4.1	7.4	4.1	6.9	5.1
Strongly agree	3.0	1.6	2.7	3.4	4.1	3.3	2.7
Don't know	5.1	6.2	3.9	5.1	5.8	4.3	6.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sometimes it is OK to degrade the environment to promote economic development.							
Strongly disagree	41.0	40.1	41.5	41.0	36.7	40.0	42.4
Mildly disagree	24.4	23.2	26.8	24.0	21.7	24.2	24.4
Neutral	12.7	12.1	12.5	12.8	12.2	14.3	10.0
Mildly agree	14.1	13.8	13.9	14.3	17.5	13.5	15.1
Strongly agree	3.8	5.8	3.0	3.6	6.3	4.5	2.7
Don't know	4.0	5.0	2.3	4.2	5.6	3.5	5.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
A healthy economy depends on a healthy environment.							
Strongly disagree	3.5	6.0	3.7	2.9	2.7	3.9	2.9
Mildly disagree	4.7	4.2	5.6	4.6	4.8	4.1	5.5
Neutral	12.7	9.5	12.7	13.5	14.7	13.8	11.4
Mildly agree	30.8	33.7	33.2	29.6	31.8	31.4	29.6
Strongly agree	45.8	42.8	43.8	47.1	44.2	45.0	47.3
Don't know	2.4	3.9	1.2	2.3	1.7	1.8	3.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(Table 11 continued on next page)

(Table 11 continued)

Response	Total	Where do you live?			Location of residence		
		Farm	Rural non-farm	City or Town	Wells Creek	Bluffland counties	Other counties
Cost should be an important consideration in making decisions on preserving rare plants and animals.							
Strongly disagree	13.2	8.6	16.1	13.5	11.6	13.5	13.1
Mildly disagree	14.7	11.6	15.2	15.3	12.6	14.2	15.7
Neutral	12.1	11.4	10.2	12.7	14.7	12.5	11.5
Mildly agree	33.3	32.6	31.5	33.9	30.0	32.9	33.3
Strongly agree	22.4	30.1	24.2	20.1	29.0	23.0	21.5
Don't know	4.3	5.7	2.7	4.4	2.0	3.9	4.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
We should limit our development and use of the environment today so that future generations will have the resources they need to live.							
Strongly disagree	2.4	2.6	2.3	2.4	3.1	2.7	1.8
Mildly disagree	4.9	7.5	3.7	4.6	4.8	4.3	5.9
Neutral	7.4	8.9	6.5	7.3	12.3	6.8	8.2
Mildly agree	30.1	32.2	31.1	29.4	33.1	31.3	28.2
Strongly agree	51.3	43.5	52.0	52.9	43.7	50.8	52.2
Don't know	3.9	5.4	4.4	3.5	3.1	4.1	3.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Conserving and restoring pre-European settlement plant communities should be an important goal of public land management agencies.							
Strongly disagree	7.9	11.8	8.6	6.8	15.1	8.6	6.7
Mildly disagree	12.7	17.7	9.5	12.4	15.1	14.6	9.6
Neutral	25.8	24.8	30.9	24.7	27.7	25.1	27.0
Mildly agree	20.9	18.4	20.1	21.7	13.7	19.7	22.5
Strongly agree	8.5	5.2	12.2	8.3	7.9	8.0	9.2
Don't know	24.2	22.1	18.7	26.2	20.5	24.0	24.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Economic development activities in my region should focus on diversifying the economy.							
Strongly disagree	1.2	2.4	1.2	1.0	1.7	1.6	0.6
Mildly disagree	3.5	5.7	6.1	2.3	7.3	3.8	2.9
Neutral	21.1	20.7	22.9	20.6	27.3	20.9	21.2
Mildly agree	37.2	40.0	32.6	37.8	34.6	38.0	35.8
Strongly agree	21.6	19.4	22.8	21.8	16.3	20.7	23.1
Don't know	15.4	11.8	14.4	16.5	12.8	15.1	16.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
When managing public lands, the economic health of my community should be given highest priority.							
Strongly disagree	8.8	7.6	10.8	8.5	5.8	10.1	7.0
Mildly disagree	18.3	11.3	21.2	19.1	15.4	18.1	18.2
Neutral	16.6	11.1	22.5	16.3	19.2	18.5	13.9
Mildly agree	29.0	36.3	20.6	29.6	29.8	28.0	30.1
Strongly agree	22.1	27.8	20.1	21.3	26.4	20.1	25.2
Don't know	5.2	6.0	4.7	5.2	3.4	5.1	5.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
River flood plains should exist in a natural state, free of buildings or other structures.							
Strongly disagree	4.3	4.3	7.3	3.5	10.8	5.9	1.6
Mildly disagree	9.5	11.8	10.6	8.7	12.2	11.0	7.2
Neutral	12.6	14.2	11.8	12.4	11.5	13.2	11.5
Mildly agree	27.6	27.3	26.2	28.0	26.8	25.6	30.1
Strongly agree	39.1	35.5	39.1	39.9	34.5	37.3	41.9
Don't know	7.0	6.8	4.9	7.5	4.2	6.9	7.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(Table 11 continued on next page)

(Table 11 continued)

Response	Total	Where do you live?			Location of residence		
		Farm	Rural non-farm	City or Town	Wells Creek	Bluffland counties	Other counties
We should maintain or enhance the diversity of wildlife populations.							
Strongly disagree	1.7	2.1	1.4	1.6	5.6	2.2	1.0
Mildly disagree	3.6	6.7	3.2	2.9	4.9	4.3	2.5
Neutral	9.2	12.1	6.7	9.1	12.2	10.6	7.1
Mildly agree	37.2	40.4	34.9	37.1	35.0	36.9	37.2
Strongly agree	44.5	33.6	50.2	45.7	40.2	42.7	47.2
Don't know	3.8	5.1	3.5	3.6	2.1	3.3	5.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Private landowners and public land managers currently work together effectively to protect the environment.							
Strongly disagree	9.3	11.8	10.3	8.4	12.0	9.2	9.8
Mildly disagree	22.4	23.2	26.5	21.2	24.7	23.4	20.7
Neutral	14.6	11.5	13.8	15.5	17.9	14.8	14.2
Mildly agree	23.4	30.5	20.2	22.6	24.1	21.1	27.0
Strongly agree	11.2	12.5	13.9	10.2	13.7	11.3	10.8
Don't know	19.1	10.4	15.3	22.1	7.6	20.1	17.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
New residential development should be restricted to areas adjacent to existing urban centers.							
Strongly disagree	5.1	4.4	6.2	4.9	5.8	6.0	3.5
Mildly disagree	13.1	10.9	17.1	12.6	9.8	13.1	13.1
Neutral	18.9	16.4	19.2	19.4	13.2	19.9	17.4
Mildly agree	29.0	25.6	29.1	29.7	30.8	28.7	29.4
Strongly agree	23.9	33.6	21.5	22.3	36.3	23.0	25.2
Don't know	10.0	9.1	6.8	11.0	4.1	9.4	11.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
We should maintain or enhance the diversity of natural plant communities.							
Strongly disagree	1.6	2.1	1.8	1.4	3.8	1.9	1.0
Mildly disagree	4.4	10.1	3.8	3.2	5.5	5.1	3.5
Neutral	21.0	28.5	20.1	19.5	29.7	22.0	19.1
Mildly agree	39.3	31.3	42.0	40.4	35.5	37.8	41.1
Strongly agree	23.6	18.5	24.8	24.5	16.2	23.4	24.2
Don't know	10.1	9.4	7.4	11.0	9.3	9.7	11.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 12.—*Please consider each statement below and indicate whether you would like to see less, more, or about the same of each in your region. Percentages shown by where respondents live and by location of residence.*

(In percent)

Response	Total	Where do you live?			Location of residence		
		Farm	Rural non-farm	City or Town	Wells Creek	Bluffland counties	Other counties
Area of natural cover, including forests, woodlands, prairies, and wetlands							
Want less	1.3	2.1	1.8	1.0	5.4	1.7	0.6
Want same	38.8	51.5	36.9	36.4	56.9	41.3	35.1
Want more	56.1	42.1	57.9	58.9	36.8	53.4	60.5
Don't know	3.7	4.3	3.4	3.7	1.0	3.6	3.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Area of new residential development in rural areas							
Want less	54.6	53.3	58.9	53.8	64.6	55.6	53.5
Want same	34.0	39.2	35.5	32.4	28.9	32.2	36.2
Want more	5.1	3.3	2.7	6.2	3.4	5.8	4.1
Don't know	6.3	4.1	3.0	7.7	3.1	6.4	6.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Area devoted to the protection of rare plant and animal species							
Want less	9.1	15.3	9.1	7.6	14.7	10.0	7.6
Want same	46.6	55.3	45.3	44.9	50.8	47.6	44.5
Want more	35.5	21.2	37.2	38.4	25.4	35.3	36.2
Don't know	8.8	8.2	8.4	9.1	9.0	7.1	11.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Area of pre-European settlement plant communities that are being conserved or have been restored							
Want less	11.0	17.5	11.4	9.3	18.2	12.4	8.7
Want same	44.2	50.7	43.2	42.9	45.8	44.3	43.7
Want more	16.9	9.8	21.2	17.4	13.1	16.6	17.0
Don't know	28.0	22.0	24.2	30.4	22.9	26.7	30.6
Total	100.0	100.0	100.0	100.07	100.0	100.0	100.0
Area of new light industrial development in rural areas							
Want less	37.8	33.2	49.4	35.8	45.0	40.3	33.7
Want same	35.9	38.7	33.7	35.9	33.6	34.0	39.1
Want more	17.5	22.1	11.9	17.9	12.4	16.4	19.2
Don't know	8.8	6.0	5.0	10.4	9.1	9.3	8.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Area of public land managed using techniques that attempt to imitate nature							
Want less	15.2	23.8	17.8	12.5	23.9	15.9	14.0
Want same	30.5	38.9	33.1	27.9	33.8	29.3	32.1
Want more	38.7	28.4	38.6	41.1	25.3	39.2	38.0
Don't know	15.6	9.0	10.6	18.4	17.1	15.5	15.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Length of rivers or streams that have been straightened or channeled							
Want less	38.4	31.0	42.0	39.1	32.7	40.3	35.0
Want same	36.1	38.1	35.0	35.9	38.8	35.1	37.9
Want more	7.9	12.9	6.1	7.2	8.2	9.1	5.9
Don't know	17.7	18.1	16.9	17.8	20.4	15.5	21.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(Table 12 continued on next page)

(Table 12 continued)

Response	Total	Where do you live?			Location of residence		
		Farm	Rural non-farm	City or Town	Wells Creek	Bluffland counties	Other counties
Area of wetlands that have been restored or conserved							
Want less	7.0	15.8	5.1	5.5	11.7	7.4	6.3
Want same	33.2	41.8	37.6	30.0	41.0	33.8	32.0
Want more	49.8	31.8	50.8	53.6	39.7	48.5	51.8
Don't know	10.0	10.6	6.5	10.9	7.7	10.3	9.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of recreation areas devoted to non-motorized outdoor recreation							
Want less	7.3	13.1	8.8	5.6	13.5	8.8	4.8
Want same	38.0	46.7	36.7	36.4	41.6	34.7	42.9
Want more	48.8	31.3	49.4	52.6	39.2	52.0	43.8
Don't know	5.9	8.9	5.0	5.4	5.7	4.4	8.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Area of river flood plains that have been maintained or restored to their natural state, free of structures							
Want less	4.3	5.5	7.7	3.1	10.5	4.8	3.2
Want same	38.3	46.8	37.6	36.4	42.2	40.9	34.2
Want more	46.9	34.8	49.0	49.2	36.7	45.3	49.2
Don't know	10.6	12.9	5.7	11.3	10.5	8.9	13.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Areas in towns and cities planted to trees and shrubs							
Want less	0.6	1.0	1.1	0.3	1.7	0.4	0.8
Want same	20.2	26.8	15.0	20.1	26.2	21.3	18.7
Want more	76.0	66.7	81.1	76.8	68.1	75.2	76.9
Don't know	3.2	5.4	2.7	2.9	4.0	3.1	3.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Areas of forest devoted to supporting the local wood products industries							
Want less	21.4	13.1	20.5	23.6	19.8	23.7	17.9
Want same	36.5	41.2	36.9	35.4	34.6	37.7	34.7
Want more	29.2	35.2	30.4	27.6	36.6	27.1	32.7
Don't know	12.8	10.5	12.2	13.4	9.1	11.5	14.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 13.—*Responses to open-ended questions relating to pressing land use problems and likes and dislikes about living in the area. Answers given by at least 5 percent of the respondents are reported. Percentages shown by where respondents live and by location of residence.*

(In percent)

Response	Total	Where do you live?			Location of residence		
		Farm	Rural non-farm	City or Town	Wells Creek	Bluffland counties	Other counties
In your opinion, what are the two most pressing land use or environmental problems in your region?							
Water quality	23.2	11.4	28.6	24.4	19.9	22.9	23.8
Soil erosion	19.0	31.5	19.5	16.0	18.5	20.6	16.5
Over population and housing development	15.6	14.5	15.4	15.9	18.0	18.9	10.4
Chemical use on land	11.9	16.4	12.6	10.6	12.8	10.3	14.3
Wetlands	10.3	9.7	11.9	10.0	3.3	8.0	14.0
Wildlife habitat	9.0	8.9	8.5	9.1	3.3	10.0	7.3
Woodlands/natural area	8.7	6.6	7.9	9.4	7.1	8.6	8.8
Waste management	7.9	5.5	8.5	8.2	5.7	7.4	8.5
Farm practices	7.8	6.7	9.1	7.6	11.8	6.9	9.1
Ground water	7.6	4.3	8.5	8.1	8.5	8.9	5.5
Fertilizer/pesticide/waste runoff	7.6	5.8	7.9	8.0	5.2	6.3	9.8
Government policies	6.5	7.1	6.0	6.6	10.4	5.4	8.5
Flooding	6.1	4.3	4.1	7.1	3.3	6.9	4.9
City expansion	5.4	5.9	3.8	5.7	4.7	5.7	4.9
Total number of weighted responses	104,914	15,887	19,619	69,407	342	64,279	40,419
What do you like most about living in your area?							
Physical setting	43.1	49.1	53.3	39.1	57.1	45.4	39.2
Like community	25.1	24.5	20.5	26.4	17.4	21.5	31.1
Outdoor recreation	12.7	1.2	12.8	15.3	6.8	15.2	8.7
Low population	9.9	5.3	9.0	11.2	6.8	7.6	13.8
Air quality	6.7	10.4	3.2	6.8	8.2	6.0	7.8
Low crime/safety	6.7	3.8	5.8	7.6	4.1	6.8	6.6
Wildlife habitat	5.3	12.2	7.1	3.3	5.9	5.4	5.1
Total number of weighted responses	109,090	16,204	19,256	73,630	355	67,585	41,158
What do you like least about living in your area?							
Climate/weather	17.4	11.8	17.2	18.4	12.8	16.0	19.6
Good jobs (lack of)	7.8	12.3	8.6	6.7	3.4	7.5	8.3
Government policies (regulations)	7.6	11.7	4.9	7.6	6.0	8.2	6.7
Fewer resources	7.3	3.7	6.5	8.2	4.0	6.7	8.3
Total number of weighted responses	79,033	10,051	15,060	53,922	242	49,219	29,575

Table 14.—*Responses to questions relating to stability of the area population—how long they have lived in the region and whether they would like to continue living in the region. Percentages shown by where respondents live and by location of residence.*

(In percent)

Response	Total	Where do you live?			Location of residence		
		Farm	Rural non-farm	City or Town	Wells Creek	Bluffland counties	Other counties
How long have you lived in southeastern Minnesota?							
Less than one year	0.2	0.0	0.0	0.3	0.0	0.4	0.0
1-5 years	5.8	1.5	3.1	7.4	2.0	7.4	3.2
6-10 years	6.5	2.3	10.0	6.5	2.0	7.0	5.5
11-20 years	9.3	2.6	14.1	9.6	9.3	11.4	6.1
More than twenty years	78.3	93.6	72.7	76.2	86.7	73.8	85.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Would you like to continue to reside in the area?							
Yes	98.0	100.0	98.2	97.4	98.0	98.2	97.6
No	2.0	0.0	1.8	2.6	2.0	1.8	2.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 15.—*Personal characteristics of respondents. Percentages shown by where respondents live and by location of residence.*

(In percent)

Response	Total	Where do you live?			Location of residence		
		Farm	Rural non-farm	City or Town	Wells Creek	Bluffland counties	Other counties
Where do you live?							
Farm	15.6	100.0	0.0	0.0	54.4	14.0	17.8
Rural non-farm	17.3	0.0	100.0	0.0	29.4	17.8	16.4
City or town	67.1	0.0	0.0	100.0	16.2	68.2	65.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Do you earn any income from farming?							
Yes	17.6	75.8	6.6	6.9	54.1	14.2	22.8
No	82.4	24.2	93.4	93.1	45.9	85.8	77.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Do you live on a lake shore or river front?							
Yes	8.9	5.9	20.3	6.7	2.7	9.2	8.6
No	91.1	94.1	79.7	93.3	97.3	90.8	91.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

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Kelly, Tim; Sushak, Ron.
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As a compliment to direct citizen participation, the Minnesota Department of Natural Resources used a survey of area landowners to help inform it's comprehensive watershed management initiative. Results from the survey have been useful to resource managers and area residents as they carry out this planning effort.

KEY WORDS: Public participation, participatory planning, comprehensive watershed management, partnerships.

Our job at the North Central Forest Experiment Station is discovering and creating new knowledge and technology in the field of natural resources and conveying this information to the people who can use it. As a new generation of forests emerges in our region, managers are confronted with two unique challenges: (1) Dealing with the great diversity in composition, quality, and ownership of the forests, and (2) Reconciling the conflicting demands of the people who use them. Helping the forest manager meet these challenges while protecting the environment is what research at North Central is all about.